

PATENT  
Application No. 10/776,882  
Docket No. 59004.US

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently amended) A method of detecting a latent pattern of target molecular structures present on a surface of a solid support, the method comprising:

providing a type solution of colloidal particles, substantially each colloidal particle carrying a net electric charge and [[is]] being capable of electrostatic interaction with the solid support and the target molecular structures so as to be capable of precipitating on the solid support at locations corresponding to locations of the target molecular structures of interest;

~~contacting the colloidal particles and the solid support on which said latent pattern of molecular structures need be detected~~ exposing the surface of the substrate to the solution of colloidal particles under conditions of precipitation to yield a layer of precipitated colloidal particles on the surface of the substrate, the layer of precipitated colloidal particles having a density which varies corresponding to the presence the target molecular structures; and

~~observing a detectable change brought about by colloidal particles precipitated on the surface of the solid support such that the density of precipitated colloidal particles on the surface follows the pattern of the molecular structures which need be detected~~ measuring the varying density of the precipitated colloidal particles on the surface of the substrate to determine the locations and quantity of the target molecular structures on the surface of the solid support.

2. (Original) The method of claim 1 wherein the latent pattern of molecular structures is formed by hybridized nucleic acids.

3. (Original) The method of claim 1 wherein the latent pattern of molecular structures is resulted from specific binding of target and probe proteins.

4. (Currently amended) The method of claim 1 wherein the colloidal particles comprise particles having a size of ~~having size of less than~~ less than about 10  $\mu\text{m}$ ; ~~and more preferably having the size of less than~~ 1  $\mu\text{m}$ .

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5. (Currently amended) The method of claim 1 wherein the colloidal particles comprise are ~~essentially~~ gold nanoparticles.
6. (Currently amended) The method of claim 1 wherein the colloidal ~~particle-carrying~~ particles have a net negative electric charge.
7. (Currently amended) The method of claim 1 wherein the colloidal particles are covered by a positively charged polymer substance ~~and therefore are carrying a net positive electric charge in solutions with widely varied pH value.~~
8. (Currently amended) The method of claim 1 ~~wherein surface of solid support additionally is treated in~~ further comprising the step of treating the surface of the solid support with a solution of a positively charged polymer substance.
9. (Currently amended) The method of claim 1 ~~wherein surface of solid support additionally is treated in~~ further comprising the step of treating the surface of the solid support with a solution of a negatively charged polymer substance.
10. (Currently amended) The method of claim 1 wherein the latent pattern of molecular structures is ~~created~~ provided on the surface of the solid support by enzymatic digestion of molecular structures on the surface of the solid support.
11. (Currently amended) A method of detecting a latent pattern of target molecular structures on ~~the~~ a surface of a solid support, the method comprising:
- providing a type first agent comprising a solution of colloidal particles, substantially each colloidal particle carrying a net electric charge and [[is]] being capable [[for]] of electrostatic interaction with the solid support and the target molecular structures so as to be capable of precipitating on the solid support at locations corresponding to locations of the target molecular structures of interest;
- providing ~~an alternative~~ a second agent, which second agent can be absorbed is absorbable on the surface of the solid support and, when absorbed on the surface, said second

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agent prevent inhibits colloidal particles of the first agent from precipitating in corresponding sites of the solid support;

~~contacting the mixture of colloidal particles and said alternative binding agent with the exposing the surface of the solid support on which said latent pattern of molecular structures need be detected to the solution of the first agent and the second agent to yield a layer of precipitated colloidal particles on the surface of the substrate, the layer of precipitated colloidal particles having a density which varies corresponding to the presence the target molecular structures and corresponding to the absorption of the second agent on the surface of the solid support; and~~

~~observing a detectable change brought about by colloidal particles precipitated on the surface of the solid support such that density of precipitated colloidal particles on the surface follows the pattern of the molecular structures and is given by difference of binding rate of colloidal particles and the absorption rate of the alternative binding agent to corresponding sites of the solid support measuring the varying density of the precipitated colloidal particles on the surface of the substrate to determine the locations and quantity of the target molecular structures on the surface of the support.~~

12. (Currently amended) A method of detecting a latent pattern of target molecular structures on the a surface of a solid support, the method comprising:

providing a type first agent comprising a solution of colloidal particles, substantially each colloidal particle carrying a net electric charge and [[is]] being capable [[for]] of electrostatic interaction with the solid support and the target molecular structures so as to be capable of precipitating on the solid support at locations corresponding to locations of the target molecular structures of interest;

providing an alternative a second binding agent, which agent can bind either to the surface of the solid support or to the colloidal particles, and which second agent when bind bound to the surface prevents inhibits ones of the colloidal particles carrying the same second binding agent bound thereto from precipitating in corresponding sites of the support;

~~contacting the mixture of colloidal particles and said alternative binding agent with the exposing the surface of solid support on which said latent pattern of molecular structures~~

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~~need be detected to the solution of the first agent and the second agent to yield a layer of precipitated colloidal particles on the surface of the substrate, the layer of precipitated colloidal particles having a density which varies corresponding to the presence the target molecular structures and corresponding to differences between the degree of binding of the second agent on the surface of the solid support and the degree of binding of the second agent to the colloidal particles; and~~

~~observing a detectable change brought about by colloidal particles precipitated on the surface of the solid support such that density of precipitated colloidal particles on the surface follows the pattern of the molecular structures and is given by difference of the absorption rate of the agent to colloidal particles and corresponding sites of the solid support measuring the varying density of the precipitated colloidal particles on the surface of the substrate to determine the locations and quantity of the target molecular structures on the surface of the support.~~

13. (Currently amended) A method of detecting a latent pattern of target molecular structures on the a surface of a solid support, the method comprising:

providing a ~~opaque solid support having a surface or equally acceptable, providing a transparent solid support with back side blackened by light absorbing paint;~~

creating ~~[[the]]~~ a latent pattern of target molecular structures on the surface of the solid support by immobilizing probe molecular structures in multiple sites on the solid support and binding the probe molecular structures with target molecular structures in a sample substance; and

visualizing the latent pattern by precipitating colloidal particles on the surface of the solid support and capturing an image of diffusely reflected light from the surface of the support.

14. (Currently amended) A method of detecting a latent pattern of target molecular structures on the a surface of a solid support, the method comprising:

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providing a transparent solid support and a light absorbing screen, and ~~means, such as a cassette, of keeping~~ the screen ~~[[on]]~~ a predetermined distance behind the transparent support;

creating ~~[[the]]~~ a latent pattern of molecular structures on the solid support by immobilizing probe molecular structures in multiple test sites on the solid support and binding the probe molecular structures with target molecular structures by exposing the solid support to a sample substance;

visualizing the latent pattern by precipitating colloidal particles on the surface of the solid support and capturing an image of diffusely reflected light from the surface of the support.

15. (New) The method of claim 13, wherein the solid support comprises an opaque substrate.
16. (New) The method of claim 13, wherein the solid support comprises a transparent substrate.
17. (New) The method of claim 13, wherein the solid support comprises a transparent substrate having a back side blackened by a light absorbing paint.
18. (New) The method of claim 1, wherein the solid support comprises an opaque substrate.
19. (New) The method of claim 1, wherein the solid support comprises a transparent substrate.

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20. (New) The method of claim 1, wherein the solid support comprises a transparent substrate having a back side blackened by a light absorbing paint.

21. (New) The method of claim 1, wherein the solid support comprises a transparent substrate having a light absorbing screen located a predetermined distance behind the substrate.